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AMSAT NEWS SERVICE
ANS-324

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on http://www.amsat.org publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to: ans-editor [at] amsat.org

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ANS-324 AMSAT News Service Weekly Bulletins

To: All RADIO AMATEURS
From: Radio Amateur Satellite Corporation
712 H Street NE, Suite 1653
Washington, DC 20002

DATE 2022 NOV 20

OMOTENASHI is Struggling to Carry Amateur Radio to the Moon

OMOTENASHI, a project of the JAXA Ham Radio Club, was a secondary payload aboard NASA's Artemis 1 mission, launched on November 16. It plans to land on the surface of the moon, and to transmit a beacon in the amateur 70cm band.

Controllers have reported OMOTENASHI is tumbling, making it difficult for the spacecraft to charge its batteries and communicate with the ground. Of the ten cubesats flown as secondary payloads, seven are operation, two have not been heard from, and OMOTENASHI is struggling. Controllers are continuing recovery attempts.

OMOTENASHI is derived from Outstanding MOon exploration TEchnologies demonstrated by NAno Semi-Hard Impactor. Omotenashi is also a Japanese word for hospitality.

JAXA Ham Radio Club planned to utilize the flight demonstration opportunity of the OMOTENASHI mission to conduct the following amateur radio missions:
 (i) To conduct technological research with respect to receiving ultra-weak UHF signal from a space probe toward the moon
 (ii) To conduct an outreach activity providing amateur radio operators all over the world with an opportunity to try to receive signals from moon region.

OMOTENASHI is a 6U-CubeSat with external dimensions of 239 x 366 x 113mm and an approximate mass of 14 kg.

OMOTENASHI consists of three modules: orbiting module, retro motor module, and surface probe. During the moon transfer orbit, these modules are integrated. When OMOTENASHI arrives at the moon, the surface probe will be separated and conduct semi-hard landing.

If control is regained, OMOTENASHI will be actively controlled by ultra-small attitude control system including star tracker, sun sensor, IMU, reaction wheel, and cold gas jet thruster. During the moon transfer orbit, OMOTENASHI may be spin-stabilized due to the strict resources. For further details, please see:
https://www.isas.jaxa.jp/home/omotenashi/JHRCweb/jhrc.html

There will be UHF CM/PSK/PM/PSK31 beacons, with 1 watt RF, on both the orbiting module and the surface probe. CisLunar explorer, MIT KitCube and Lunar IceCube are expected to share the same launch.

Orbiting Module DOWNLINK

Frequency: 437.31 MHz
Antenna: SRR antenna
Polarization: Linear
Modulation: beacon, PSK31 Sync Word C1 (ASCII code)
Power: 30dBm

Surface Probe DOWNLINK

Frequency: 437.41 MHz
Antenna: invert-F antennax4
Polarization: LHCP(, RHCP)
Modulation: FM, PSK31, PCM-PSK/PM Sync Word C1 (ASCII code)
Power: 30dBm

JAXA Ham Radio Club had announced prior to launch that amateurs can constantly access the newest TLE from https://bit.ly/3wyopTr This file is to be overwritten when the next TLEs are calculated. However, the site appears to still display pre-launch keps at this time.

The JAXA Club posts updates at
https://www.isas.jaxa.jp/home/omotenashi/JHRCweb/jhrc.html

[ANS thanks JAXA Ham Radio Club and parabolicarc.com for the above information]

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Keep Amateur Radio in Space!
 https://www.amsat.org/join-the-amsat-presidents-club/
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and the other the digi “terminal.”

Ops may add GetKISS+ software, by Mike Rupprecht, DK3WN, in order to upload received packets to SatNOGS. This isn’t necessary, but it does help add coverage for telemetry. This software is a bit tricky to get working, but once you have one of Mike’s programs running other programs will work without any issues. Mike’s software can be found here: https://www.satblog.info/software/

Doug Papay, K8DP, recommends installing GetKISS+ v1.4.1 (he could not get v1.4.2 to work). It requires VB6 runtime, which should already be installed, and the ActiveX OCX controls need to be registered. See: https://www.pe0sat.vgnet.nl/decoding/tlm-decoding-software/dk3wn/ for instructions on how to do this. Make sure to run the command prompt as Administrator when performing the regsrv32.exe commands. Also, do not delete or move the OCX files after registering them. (The OCX files should be placed in C:\Libraries\OCX folder)

Mike also has a GreenCube Telemetry Decoder that you can download—it is a nice program that graphically displays the telemetry. He has also added a digipeater message display and list of unique callsigns heard—a nice feature.

The config.ini files will need to be updated to reflect your station details. These files are located in the folder where you keep GetKISS+ and GreenCube Telemetry Decoder.

GetKISS+ and GreenCube Telemetry Decoder connect via TCP to the soundmodem all using the same IP (localhost) and port number.

Some have been confused by the lack of an ACK message after transmitting a packet to the satellite. It is sent only if the Tx delay is used. However, it is better to use Tx delay 0 for real-time QSOs to avoid unnecessary transmission by the bird (saving on-board power). With Tx delay 0 you will receive your own message as an acknowledgement.

[ANS thanks Doup Papay, K8DP, and Jean Marc Momple, 3B8DU, for the above information]

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coordinated.

[ANS thanks Michael Chen, BD5RV/4, for the above information]

U.S. High School CubeSat to be APRS Relay

TJREVERB, a 2U CubeSat built by Thomas Jefferson High School for Science & Technology, has been frequency coordinated to operate as an APRS relay on 145.825 MHz. It is scheduled for launch on the SpaceX Falcon 9 rocket and Dragon spacecraft set to deliver additional science, crew supplies, and hardware to the International Space Station next week. The satellite will be released from ISS at a later time.

The first U.S. high school to send a CubeSat to space back in 2013, Thomas Jefferson High School for Science and Technology's Research and Education Vehicle for Evaluating Radio Broadcasts satellite aims to study the use of iridium as a primary radio communication method. Additionally, the satellite will demonstrate using a passive magnet onboard and the Earth's magnetic field for stabilization rather than using an attitude determination and control system for pointing accuracy and stabilization for iridium. What makes this satellite even more notable is that it was a system's engineering project. The students selected space-grade parts, wired the electronics for the satellite, wrote the drivers to control the different systems, and coded the flight software.

"What's special about TJREVERB isn't necessarily the mission, it's what we did. These kids literally built a satellite the way the industry would build a satellite; we selected parts from vendors and got those parts to work together," said Kristen Kucko, robotics lab director and the school's space faculty advisor. "This is an engineering feat."

[ANS thanks NASA Blogs and IARU for the above information]

CAPSTONE Arrives to Orbit at the Moon

The CAPSTONE mission operations team confirmed that NASA's CAPSTONE spacecraft arrived at its orbit at the Moon Sunday evening. The CubeSat completed an initial orbit insertion maneuver, firing its thrusters to put the spacecraft into orbit, at 12:39 UTC on Nov. 13.

CAPSTONE is now in a near-rectilinear halo orbit, or NRHO. This particular NRHO is the same orbit that will be used by Gateway, the Moon-orbiting space station that will support NASA's Artemis missions. CAPSTONE is the first spacecraft to fly an NRHO, and the first CubeSat to operate at the Moon.

In the next five days, CAPSTONE will perform two additional clean-up maneuvers to refine its orbit. After these maneuvers, the team will review data to confirm that CAPSTONE remains on track in the NRHO.

CAPSTONE – short for Cislunar Autonomous Positioning System Technology Operations and Navigation Experiment – is a precursor to the Gateway project to establish a crewed space station in orbit around the moon. AMSAT, along with our ARISS partners, is developing an Amateur Radio package, including two-way communication capability, to be carried on-board Gateway in lunar orbit.

[ANS thanks NASA for the above information]

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Get your AMSAT car flag and other neat stuff
from our Zazzle store!
25% of the purchase price of each product goes
towards Keeping Amateur Radio in Space
https://www.zazzle.com/amsat_gear

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ISS callsign is presently scheduled to be RSØISS. The scheduled crewmember is Anna Kikina. Contact is go for Thu 2022-12-01 08:20 UTC.

School TBD, Vologda, Russia, direct via TBD. The ISS callsign is presently scheduled to be RSØISS. The scheduled crewmember is Anna Kikina. Contact is go for Thu 2022-12-01 08:20 UTC

The crossband repeater continues to be active. If any crewmember is so inclined, all they have to do is pick up the microphone, raise the volume up, and talk on the crossband repeater. So give a listen, you just never know.

The latest information on the operation mode can be found at https://www.ariss.org/current-status-of-iss-stations.html

The latest list of frequencies in use can be found at https://www.ariss.org/contact-the-iss.html

[ANS thanks Charlie Sufana, AJ9N, one of the ARISS operation team mentors for the above information]

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Satellite Shorts From All Over

+ The latest episode of the ARRL On the Air podcast features details from avid satellite operator Sean Kutzko, KX9X, about how to get started on the amateur satellites -- an activity that's available to hams of all license classes. Sean's article, "Ham Radio Satellites: Reliable, Accessible, and Enjoyable" is also the cover piece of the November/December issue of ARRL's "On the Air" magazine. (ANS thanks ARRL Letter for the above information)

+ A cargo spacecraft successfully docked with the International Space Station Nov. 9, despite making its two-day trek through space with only one functioning solar panel. The Cygnus spacecraft, which was carrying 8,200 pounds of science experiments and supplies for the astronauts on board the ISS, lifted off from NASA’s launch site in Wallops Island, Virginia, atop an Antares rocket on Nov. 7. A few hours after Cygnus reached orbit, one of the spacecraft’s two solar arrays failed to deploy, NASA announced. NASA and Northrop Grumman, which designed and built the Cygnus capsule, opted to abandon efforts to open the array in order to focus on carrying out a safe rendezvous with the ISS, noting that the spacecraft already had sufficient power to finish its journey. (ANS thanks CNN Space & Science for the above information)

+ SpaceX launched one of its reusable Falcon 9 rocket boosters for the last time Saturday on a rare expendable mission for Intelsat, devoting all of the launcher’s propellant toward placing a pair of television broadcasting satellites into orbit. Intelsat says it paid SpaceX an additional fee for the expendable mission. The Falcon 9 rocket lifted off at 11:06 a.m. EST (1606 GMT) Saturday after a four-day delay caused by Hurricane Nicole. The booster debuted March 2, 2019, with the first unpiloted test flight of SpaceX’s Crew Dragon capsule. The booster was not fitted with SpaceX’s recovery hardware, such as titanium grid fins or landing legs. And SpaceX did not deploy one of its drone ships for the expendable mission. (ANS thanks SpaceflightNow for the above information)

+ AROW, the Artemis Real-Time Orbit Website, is a fun, interactive display of the Orion capsule and the Artemis 1 mission is provided by NASA at: https://www.nasa.gov/specials/trackartemis/ (ANS thanks NASA for the above information)

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In addition to regular membership, AMSAT offers membership to:

* Societies (a recognized group, clubs or organization).
* Primary and secondary school students are eligible for membership at one-half the standard yearly rate.
* Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status.
* Memberships are available for annual and lifetime terms.

Contact info [at] amsat.org for additional membership information.

73 and remember to help Keep Amateur Radio in Space!

This week's ANS Editor, Mark Johns, K0JM
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